Amendments to the Claims

This listing of claims will replace all prior versions, or listings, of claims in the application.

Listing of Claims:

1-12. (canceled)

13. (previously presented) A partially completed electronic circuit controllable MEMS device comprising the combination of:

an edge hinges-inclusive multi layer covered sacrificial first substrate member;

a MEMS module protective shield member pivotally received on said sacrificial first substrate edge hinges;

a MEMS module suspended from said MEMS module protective shield member by a plurality of severable tether members;

a MEMS module protective shield member latch assembly supporting said MEMS module protective shield member and said MEMS module in a selected substrate-removed location; and

a second substrate member-received MEMS controller electronic circuit die located in said selected substrate-removed location within severable tether members distance of a said latch assembly-stabilized MEMS module protective shield member in an orientation of subsequently-electable aligned physical unification engagement with said MEMS module;

said MEMS module protective shield member enabling safe manipulative positioning and safe liquid bath-engagement of said MEMS module during removed substrate, tethered, handling, positioning and processing of said module.

14. (previously presented) The partially completed electronic circuit controllable MEMS device of claim 13 wherein said MEMS controller electronic circuit die comprises a CMOS electronic circuit.

15. (previously presented) The partially completed electronic circuit controllable MEMS device of claim 13 wherein said multi layer covered sacrificial first substrate member includes first and second polysilicon layers covering said substrate.

16. (currently amended) The partially completed electronic circuit controllable MEMS device of claim 15 wherein said MEMS module protective shield member, said MEMS module protective shield member latch assembly and said severable tether members are comprised of said polysilicon ~~material from said polysilicon~~ layer[s] material.

17. (currently amended) The partially completed electronic circuit controllable MEMS device of claim 15 further including a plurality of protective shield member lifting beam members also comprised of said polysilicon ~~material from said polysilicon~~ layer[s] material.

18. (currently amended) The partially completed electronic circuit controllable MEMS device of claim 13 wherein said MEMS module protective shield member latch assembly includes a sliding latch member held captive by a plurality of first substrate-attached rail members comprised of said polysilicon ~~material from said polysilicon~~ layer[s] material.

19. (previously presented) The partially completed electronic circuit controllable MEMS device of claim 13 wherein said sacrificial first substrate member and said second substrate member are comprised of different semiconductor materials.

20. (previously presented) The partially completed electronic circuit controllable MEMS device of claim 13 wherein said selected substrate-removed location of said MEMS module protective shield member latch assembly, said MEMS module protective shield member and said MEMS module is a position of one hundred eighty degrees rotation with respect to a planar surface of said sacrificial first substrate member.

21. (canceled)

22. (previously presented) Locking hinge positioning apparatus for a MEMS device fabrication inclusive of a substrate removed MEMS module, said apparatus comprising the combination of:

a temporary MEMS module release plate member comprised of semiconductor substrate overlay materials included in said MEMS module;

said temporary MEMS module release plate member having physical dimensions at least equal to those of said MEMS module and including pivoting hinge portions anchored in said semiconductor substrate in an edge boundary location;

a temporary MEMS module release plate member latching assembly comprised of semiconductor substrate overlay materials included in said MEMS module;

said temporary MEMS module release plate member latching assembly having an end portion slidably captured adjacent said semiconductor substrate and a movable elements extendable opposed end portion engageable with a mating portion of said temporary MEMS module release plate member during a selected hinge-rotated, off substrate MEMS module bonding positioning of said temporary MEMS module release plate member; and

a plurality of elongated tether members comprised of semiconductor substrate overlay materials included in said MEMS module and connecting at one end thereof with said MEMS module and at an opposed end thereof with said temporary MEMS module release plate member.

23. (previously presented) The locking hinge positioning apparatus of claim 22 wherein said MEMS device is comprised of said MEMS module and an electronic circuit module disposed in permanent electromagnetic field-coupled proximity in said MEMS device.

24. (previously presented) The locking hinge positioning apparatus of claim 22 wherein said semiconductor substrate overlay materials included in said MEMS module comprise polysilicon materials.

25. (previously presented) The locking hinge positioning apparatus of claim 24 wherein said temporary MEMS module carrier member pivoting hinge portions include a polysilicon hinge pin element surrounded by a plurality of movable polysilicon hinge staple portions.

26. (previously presented) The locking hinge positioning apparatus of claim 22 wherein said elongated tether members have a length dimension compatible with a feasible proximity distance between said off module position of said temporary MEMS module carrier member and said electronic circuit module during a MEMS module assembly step.

27. (previously presented) The locking hinge positioning apparatus of claim 22 wherein said MEMS module release plate member latching assembly having an end portion slidably captured adjacent said semiconductor substrate is captured by a plurality of sliding engagement guide rail members anchored on said substrate member.

28. (previously presented) The locking hinge positioning apparatus of claim 27 wherein said sliding engagement guide rail members are comprised of polysilicon material.

29. (previously presented) The locking hinge positioning apparatus of claim 27 wherein said temporary MEMS module release plate member latching assembly and said

temporary MEMS module release plate member include dimensions and substrate dispositions enabling a mutual engagement in a release plate location hinge rotated and latched at a location one hundred eighty degrees from adjacency with said substrate member.

30. (previously presented) The locking hinge positioning apparatus of claim 24 wherein said semiconductor substrate overlay materials included in said MEMS module comprise first and second superimposed polysilicon material layers each having initial oxide layer coatings received thereon.

31. (previously presented) MEMS latching apparatus for electively connecting a first MEMS component element with an adjacently disposed hinge movable second MEMS component element, said latching apparatus comprising the combination of:

a silicon semiconductor substrate member portion of said first MEMS element, said substrate having a first oxide covered polysilicon layer received thereon and a second oxide covered polysilicon layer received over said first oxide covered polysilicon layer;

an elongated slide member derived from said first polysilicon layer of said silicon semiconductor substrate member;

a slider head member connected with said elongated slide member, derived from attached portions of said first polysilicon layer and said second polysilicon layer and held in guided sliding captivity with respect to said silicon semiconductor substrate member;

a sliding cap member derived from said second polysilicon layer and movable over a selectable portion of said elongated slide member;

said sliding cap member including a cross sectional portion received in extended captivity with respect to said silicon semiconductor substrate member along said elongated slide member;

said sliding cap member including a receptacle portion engageable with a tongue portion of said adjacently disposed second MEMS element in one sliding position thereof along said elongated slide member; and

said elongated slide member and said sliding cap member being each movable with respect to said silicon semiconductor substrate member and with respect to said second MEMS element in response to application of external movement forces.

32. (previously presented) The MEMS latching apparatus of claim 31 wherein said first MEMS element and said adjacently disposed movable second MEMS element comprise portions of an electromechanical MEMS module.

33. (previously presented) The MEMS latching apparatus of claim 32 wherein said movable second MEMS element comprises a hinge-pivoted header member portion of said electromechanical MEMS module.

34. (previously presented) The MEMS latching apparatus of claim 31 wherein said first MEMS element and said adjacently disposed movable second MEMS element comprise first and second electrical contact pad portions of a MEMS module and wherein said apparatus includes a plurality of said MEMS latching apparatuses.

35. (previously presented) The MEMS latching apparatus of claim 31 wherein said first polysilicon layer and said second polysilicon layer each include oxide covering layers and wherein a portion of said first polysilicon layer oxide covering layer remains trapped intermediate slider head portions of said first polysilicon layer and said second polysilicon layer as a stiffening increasing element.

36. (previously presented) The MEMS latching apparatus of claim 31 wherein said elongated slide member derived from said first polysilicon layer is released from said substrate member into a movable condition by an etch removed fabrication-sequence oxide layer of selected thickness.

37. (previously presented) The MEMS latching apparatus of claim 31 wherein said apparatus includes first and second stop elements connected with said silicon semiconductor substrate member and limiting sliding movement of said slider head member in response to said application of external movement forces.

38. (previously presented) The MEMS latching apparatus of claim 31 wherein said slider head member guided sliding captivity and said sliding cap member extended captivity each include second polysilicon layer derived guide rail elements connected with said silicon semiconductor substrate member.

39. (previously presented) The MEMS latching apparatus of claim 31 wherein said slider head member includes a recess region disposed to receive said external movement forces and said external movement forces are applied through a portable probe tip member to said recess region.

40. (previously presented) The MEMS latching apparatus of claim 31 wherein said sliding cap member includes a clearance space with respect to said elongated slide member and wherein said clearance space is defined by removed portions of said first polysilicon layer oxide covering layer.

41. (previously presented) MEMS latching apparatus for electively connecting a first MEMS element with an adjacently disposed hinge movable second MEMS element, said latching apparatus comprising the combination of:

a substrate member portion of said first MEMS element, said substrate having a layer of first structural material received thereon and a layer of second structural material received over said first structural material layer;

an elongate d slide member derived from said layer of first structural material;

a slider head portion connected with said elongated slide member, derived from coupled portions of said layer of first structural material and said layer of second structural material and held in guided sliding captivity with respect to said substrate member;

a sliding cap member derived from said layer of second structural material and movable over a selectable portion of said elongated slide member, said sliding cap member including a cross sectional portion received in captivity with respect to said substrate member along said elongated slide member;

said sliding cap member including a receptacle portion engageable with a tongue portion of said adjacently disposed second MEMS element in one sliding position thereof along said elongated slide member; and

said elongated slide member and said sliding cap member being each movable with respect to said substrate member and with respect to said second MEMS element in response to application of external movement forces.

42. (previously presented) MEMS latching hinge apparatus comprising the combination of:

a MEMS active element module having a electromagnetic field responsive active element received in an exposed location thereof, said module comprising a plurality of active layers overlying a sacrificial substrate member;

a MEMS active element module protection member also residing in said plurality of active layers overlying said sacrificial substrate member in a location laterally displaced from said MEMS active element module, said MEMS active element module protection member exceeding said MEMS active element module in lateral extents;

said MEMS active element module protection member including a plurality of module edge received hinge elements connecting said protection member with said sacrificial substrate member;

said MEMS active element module protection member further including an electively releasable anchor apparatus connected with said substrate member and holding portions of said module in close proximity with said substrate member until electively released;

a plurality of flexible tether members also residing in said plurality of active layers overlying said sacrificial substrate member and extending between said MEMS active element module and said MEMS active element module protection member;

a MEMS active element module protection member latching assembly additionally residing in said plurality of active layers overlying said sacrificial substrate member in a selected lateral distance separation from said MEMS active element module protection member, said latching assembly including a lengthwise movable MEMS active element module protection member stabilization arm having an end portion connectable with a protrusion from said MEMS active element module protection member following a hinge rotation enabled off-chip positioning of said MEMS active element module protection member and said MEMS active element module; and

tensioned lifting beam apparatus disposed in said active layers adjacent said MEMS active element module protection member and engageable with said MEMS active element module protection member to perform initial separating of said MEMS active element module protection member from said substrate upon release of said MEMS active element module protection member from said anchor element.

43. (previously presented) The MEMS latching hinge apparatus of claim 42 wherein said MEMS active element module protection member exceeds said MEMS active element module in lateral extents.

44. (previously presented) The MEMS latching hinge apparatus of claim 42 wherein said MEMS active element module electromagnetic field responsive active element comprises a micromirror element.

45. (previously presented) The MEMS latching hinge apparatus of claim 42 wherein said MEMS active element module protection member latching assembly is comprised of two layers of structural semiconductor material disposed in removed intermediate oxide layer-achieved physical segregation.

46. (previously presented) The MEMS latching hinge apparatus of claim 45 wherein said MEMS active element module protection member latching assembly is comprised of two layers of structural semiconductor material disposed in a cross sectional pattern having

first layer portions separated from overlying second layer portions by a sliding separation gap in one location thereof and said same first layer portions coupled to overlying second layer portions in another location thereof.